

### **Contributor names and short CVs**

Jenny de Boer is a researcher in the Human Behaviour department of TNO, with a background in Industrial Design and keen interest in innovation processes and change management. Her special interest is in the impact that ICT has on society, including opportunities for developing countries.

Freek Bomhof has a background in Pattern Recognition and has been working on the intersection of technology and business/societal processes. Within TNO he has been coordinating the Big Data research programme for a number of years and. One of his current involvements is leadership of the Taskforce 'societal' within the Big Data Value Association.

Jop Esmeijer is a researcher at the strategy department of TNO, the Netherlands Organisation for Applied Scientific Research. His main research area is the societal impact of ICT, with a focus on (future) internet technologies such as Big Data and the Internet of Things. At TNO, Jop has worked for a variety of both national and international clients, such as the Dutch Ministry of Education, Culture and Science, the Dutch Ministry of Economic Affairs, The Council for Public Health and Health Care, the OECD and the European Commission.

### **Type of the presentation proposed**

Impact presentation: focus on policy development, road-mapping, exploitation and training, data-driven business models, data governance

### **Title of the presentation**

Playing the Big Data Game: understand a big data ecosystem from within and experience dilemmas in designing data-driven innovations.

### **Summary of the presentation (<100 words)**

(Big) data-driven innovation holds great potential but it is also very challenging, especially in a multi-stakeholder setting. With the aim to accelerate and increase value creation with big data, TNO has devised an applied game – based on empirical research – that provides valuable insights in the specific dynamics of big data ecosystems. It is based on the concept of dominant *control points* that (re)structure ecosystems and influence their innovative capacity and their impact on public values. The game allows stakeholders to (1) analyze the impact of 'datafication' and data-driven innovation, and (2) it supports orchestration of data-driven innovation in multi-stakeholder settings.

## Extended abstract of the presentation (at most 2 pages in 11pt A4 format)

We propose a session that comprises three elements

1. A **presentation** of the game, including empirical background of the game, and some theoretical considerations.
2. A **hands-on demonstration of the game** in two or three small groups.
3. A **plenary discussion** of the results of the demonstration of the game.

### *Context: the challenge of (big) data-driven innovation*

Big data has been called the ‘New Oil’ and is expected to create many new jobs and increase Europe’s competitiveness. However, whereas the oil industry’s structure is well-known and we know how the various stakeholders cooperate, interact and compete, there is still little knowledge of how this works in the big data ecosystem which comprises both ‘generic’ data products and services, and domain specific data-driven innovations. These insights are essential in order to strengthen the European data economy and its positioning worldwide.

As the use of (big) data and data analytics is moving to the center stage in all kinds of sectors, the complexity of the resulting value networks – or rather ecosystems – increases. Many companies, both incumbents and new entrants, are trying to position themselves to gain a competitive advantage in changing landscapes due to datafication. This shift from traditional, hierarchical supply chains to more complex and dynamic environments requires a new way of thinking where business models should no longer concern single businesses, but rather address the orchestration of whole ecosystems, which adhere to specific data-dynamics (i.e. network effects in multi-sided markets, hyper-connectivity and winner-takes-all-scenarios). Companies have to be aware of these dynamics and they have to develop strategies that address them. Additionally, policymakers need to be able to assess the potential impact of evolving data-driven ecosystems in terms of their overall value creation and innovative capacity and the impact on public values, and they need to acquire a better understanding of possible interventions that stimulate innovations and mitigate risks.

### *Objective of the Big Data Game*

The realization of successful data-driven innovations in a multi-stakeholder setting is very challenging. With the aim to accelerate and increase value creation with big data, TNO has devised an applied game – based on empirical research – that provides valuable insights in the specific dynamics of big data ecosystems. It is based on the concept of dominant *control points* that (re)structure emerging ecosystems and influence their innovative capacity and their impact on public values. The game allows stakeholders to (1) develop a more advanced understanding of the different dynamics that govern datafication and data-driven innovation and to analyze the impact, and (2) it supports orchestration of data-driven innovation in multi-stakeholder settings.

Playing the big data game, as described above, is not just fun; it also provides us with information on what the players perspectives and opinions are on different choices that have to be made in the big data ecosystem, and as such it serves the goal of better understanding how the European big data ecosystem can be shaped.

### *Background*

The principles of the Big Data game are based on research in a number of different ecosystems where data-driven innovations have been adopted. One of these studies have been performed for the OECD and comprised the analysis of data-driven innovation and its restructuring effects in three sectors and included extensive desk research and more than 70 interviews. Additionally, TNO has conducted several additional case studies with a specific focus on control points in (big) data ecosystems in its research program 'Making sense of Big Data'. The Big Data game was developed, used and adapted during this research.

#### *Presentation and hands-on demonstration*

First, we would like to present the key elements of the game, based on the research findings that are the backbone of the game.

After this presentation, we would like to provide a hands-on demonstration of the game, by actually playing it with attendants. The game is designed to be played by 5-7 players, there will be a number of observers and a facilitator. During the game, the players will have to deal with a number of dilemmas: collaborating or competing? Adopt a winner-takes-all strategy or strive for diversity? What is the most important asset and what other stakeholders will be needed to exploit it? Can additional value be found by involving other stakeholders?

#### *Plenary discussion of the results of the game*

After the demonstration, the findings and experiences in the game will be shared and discussed between the players, and will be commented on by the researchers who designed the game. This discussion of the findings of the game as played during the EDF could also be presented to a broader audience in the plenary sessions.

#### *Practical note*

We believe that actually playing a game is much more instructive than just talking about it. Therefore, we proposed a session in which the game is introduced, played, and discussed. This has some practical consequences in terms of time, location and audience. The total time slot for the proposed format will need around 1 hour. The location must allow for three groups of game players (tables and chairs must be placed together for this). The active audience, joining in the gameplay, can be no larger than 30. Of course, alternative suggestions are welcome and we are open to engage in an exploration of the alternatives with the organisation of EDF2015.